

Allison Anne Calhoun

Whitman College
Walla Walla, WA 99362
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EDUCATION

Doctor of Philosophy

Department of Chemistry
Major: Physical Chemistry

University of Georgia June 1996

“Nuclear Magnetic Resonance Spectroscopy of Xenon-129 Dissolved in Condensed Media”

Additional course work in: Soil Physical Chemistry, Soil Physics and Clay Mineralogy

Bachelor of Science Education

Major: Biology Education

University of Georgia June 1993

PROFESSIONAL EXPERIENCE

Associate Professor (2007-current), Chair (2007-2010), Department of Chemistry

Assistant professor (2002-2007), Department of Chemistry

Whitman College, Walla Walla, WA

August 2002-present

- Teach introductory, advanced general chemistry and associated lab, general chemistry lab, physical chemistry, biophysics, aqueous geochemistry, advanced quantum chemistry and polymer science
- Thesis/Research advisor for thirty students
- Academic advisor to both pre-major and chemistry major students
- American Chemical Society Certification Liaison
- Member of faculty governance teaching load assessment committee (Spr 2010-Spr 2011), eight tenure-line search committees (Classics, Chemistry and Geology), and five college service committees (Library (F 2003-Spr 2006), Admission and Financial Aid (F 2003-Spr 2006), Faculty Fringe Benefits (F 2004-Spr 2006), Undergraduate Conference (F 2004-Spr 2006), ASID (F 2005-Spr 2006)

Visiting Assistant Professor

Mercer University, Macon, GA

August 2001 – July 2002

- Taught three sections of first semester General Chemistry
- Supervised two undergraduate students on a research project involving the surface chemistry effects of ground calcium carbonate in film
- Member of the Lab User Fee Committee for allocating money within the department

R&D Group Leader – PM Americas

Imerys Pigments and Additives, Performance Minerals Business Unit, Sandersville, GA

June 1996 - July 2001

- Developed new products for identified markets based on customer surveys using a “Fitness for Use” process. (Successful commercialization of a product for breathable film – 5/00, PVC siding – 6/98)
- Performed basic research on surface modified calcium carbonates to understand the mechanism of interaction between the coating and the mineral as well as performance attributes in specific applications

- Worked directly with customers on technical service and application development projects related to the use of calcium carbonate in their applications.
- Provided technical literature for use by Sales & Marketing personnel in targeted markets.
- Supervised five technicians and two professionals in technical service and new product development work for the Performance Minerals Business Unit.
- Worked directly with production sites on new product development, QC test procedures and specifications to ensure product fitness for the intended market and that the testing performed is appropriate for the application.

JOURNAL PUBLICATIONS, REPORTS, BOOKS and EDUCATIONAL DOCUMENTS

PEER REVIEWED JOURNAL ARTICLES

2002-current

Calhoun, A.⁺ “Isothermal Thermal Gravimetric Analysis of the Oxidation of Polypropylene and Polyethylene.” In Preparation

Calhoun, A.; King, A.D., Jr.⁺ (2007) “The Solubility of Ethane in Solutions of Sodium Alkyl Sulfonates of Various Chain Lengths” Journal of Colloid and Interface Science. 309(2), 505-509.

Calhoun, A.⁺; Chiang, E.N.* (2006) “Determination of the Surface Energetics of Surface Modified Calcium Carbonate Using Inverse Gas Chromatography.” Journal of Vinyl and Additives. 12(4) 174-182.

Calhoun, A.⁺ Nicholson*, P.D.; Barnes, A.* (2006) “The Role of Oxidation on the Surface Energetics of Polypropylene as Determined by Inverse Gas Chromatography.” Polymer Degradation and Stability. 91, 1964 – 1971.

Mobley, G.; Boutelle, T; Garrett, S.; Joiner, L.; **Calhoun, A.**⁺ (2002) “Effect of Calcium Carbonate on the Abrasive Wear of Melt Processing Equipment in Filled Systems” Journal of Vinyl and Additives Technology. V8, #4.

Calhoun, A.R.; A.D. King Jr.⁺ (1999) “NMR Chemical Shifts of ¹²⁹Xe Dissolved in Liquid Ethers, Secondary Amines and Alkyl Sulfides” Appl. Magn. Reson. 15, 95-106.

Lim, Y-H; **A.R. Calhoun;** A.D. King Jr.⁺ (1997) “NMR Chemical Shifts of ¹²⁹Xe Dissolved in Liquid Haloalkanes and Their Mixtures” Appl. Magn. Reson. 12, 555-574.

* indicates student collaborators

⁺ indicates primary author

Books

2002-current

Calhoun, A.; Johal, M. Advanced General Chemistry, an Integrated Approach. (2014) Taylor Francis Publishing. Under Contract.

Calhoun, A. “**Polypropylene**” A chapter in Multilayer Flexible Films, (2009) Edited by John Wagner. William Andrew publishing. Elsevier.

Peacock, A.J.; **Calhoun, A.** (2006) Polymer Chemistry, Properties and Applications Hanser-Gardner Publications.

Plastics Technician's Toolbox® Books

The Toolboxes are a series of books written to provide an understanding of the fundamentals and details relevant to specific polymer manufacturing processes. The books were developed by a Steering Committee, who created the table of contents, recruited authors and designed the content necessary for training operators and technicians working in these industries. The editors reviewed submissions, corrected technical errors and rewrote material that was poorly written with the goal of creating a cohesive series of books.

Calhoun, A; Wagner, J. – co-editors (2004) Plastics Technician's Toolbox®: Single and Twin Screw Extruders. Society of Plastics Engineers.

Calhoun, A; Wagner, J. – co-editors (2004) Plastics Technician's Toolbox®: Multi-Screw Extruders, Continuous Mixers and Kneaders. Society of Plastics Engineers.

Calhoun, A; Wagner, J. – co-editors (2004) Plastics Technician's Toolbox®: Extrusion Processes. Society of Plastics Engineers.

Calhoun, A; Golmanavich, G (2002) Plastics Technician's Toolbox® -Fundamental Skills and Polymer Science. Society of Plastics Engineers.

Calhoun, A; Golmanavich, G (2002) Plastics Technician's Toolbox® -Fundamental of Machine Operations. Society of Plastics Engineers.

Calhoun, A.R. (2002) "Polymer Chemistry" A Chapter in Plastics Technician's Toolbox® Society of Plastics Engineers. Brookhaven, CT

Internal Reports

2002-current

Laxson, W., Fennell, B., Calhoun A. (2009) "Methodology and Characterization of Eggshell Separation and Their Products Via Mechanical and Chemical Methods for Commercialization of Eggshell Recycling for Use in Polymeric Goods."

Laxson, W. Calhoun, A. (2008) "Eggshell Separation from Membrane Via Chemical and Mechanical Means." (*Report submitted to Midwestern Continental Development Company.*)

Stansbery, G*.; **Calhoun, A.** (2006) "Selenium Analysis of Eastern Washington Soils: A Corollary Study for the Eastern Washington Mule Deer Initiative."(*Project report submitted to Woodrow Myers of Washington Department of Fish and Wildlife*)

Calhoun, A.⁺ (2004) "Correlation of NAA Analysis of Sodium Levels with Hegman Grind Analysis on Dispersant Processed GCCs". (*Internal report submitted to Imerys Pigments and Additives*)

Chiang, E;* **Calhoun, A.**⁺ (2004) "Surface Energy of Modified Calcium Carbonates as a Function of Functionalized Silane Coating Agents" August 2004. (*Project Report submitted to: Bruce Marks, AET Inc.*)

Calhoun, A.⁺ (2004) "NAA Analysis of Sodium Levels on High and Low Dispersant Processed GCCs". (*Project report submitted to Imerys Pigments and Additives*)

Calhoun A.⁺ (2004) "Analysis of Complaint Films For Residual Catalyst Metal Species" . (*Project report submitted to AET, Inc.*) [This report was not released for review by departmental or external reviewers due to the sensitive nature of the complaint and company liability issues.]

* indicates student collaborators

+ indicates primary author

Prior to 2002

While at Imerys I worked on over 200 projects that were communicated in technical reports. These reports presented findings on materials used in a variety of applications including rigid vinyl products such as vinyl siding, pvc pipe, guttering and downspouts, flexible pvc materials such as linoleum flooring, tool handle covers and wire and cable sheathing, polyolefin materials such as diaper backsheet, overwrap white labels, hygienic films, plastic buckets and flower pots, plastic cutlery and large industrial polypropylene pallets. Processes supported in this work included extrusion, injection molding, film blowing and casting, blow molding, and compounding. Submitted reports ranged from brief summaries of technical findings associated with complaint materials to over 50 page documents describing fundamental R&D efforts or technical marketing work.

Educational Documents

ACS Physical Chemistry Examination Committee – Thermodynamics (2009) beta test for 2010 test completed.

ACS Physical Chemistry Examination Committee – Quantum Chemistry (2011) beta tests completed

ACS Physical Chemistry Examination Committee – Dynamics Material – in development

PRESENTATIONS AND PROCEEDINGS

2002-current

Bruce, C.; Calhoun, A. (2011) Adventures of the Lone Rangers: The Benefits and Challenges of Being the Sole Physical Chemist in a Chemistry Department. Podium Presentation - ACS Spring National Meeting.

Calhoun, A.⁺ (2007) “Isothermal Thermal Gravimetric Analysis of the Oxidation of Polypropylene” ANTEC 2007.

Calhoun, A.⁺, King, A.D., Jr.; Phillips, S.T.* (2006) “Hydrophobic Gases as Probes of Micellar Structures” Invited lecture at University of Georgia

Calhoun, A.⁺; Nicholson, P.D.*, Barnes, A.*; (2004) “The Role of Oxidation on the Surface Energetics of Polypropylene as Determined by Inverse Gas Chromatography.” ANTEC 2004

Prior to 2002

Ansari, D.M.⁺ **Calhoun, A.**; Merriman, P. “The Role of Calcium Carbonate in Microporous Film Applications”. Intertech’s Functional Fillers and Additives Proceedings. (2001) *Paper presented by Dr. Ansari*

Mobley, G.; Boutelle, T.; Garrett, S.; Joiner, L.; **Calhoun, A.**⁺ “The Effect of Calcium Carbonate on the Abrasive Wear of Melt Processing Equipment in Filled Systems”. Vinyltech 2001 – Proceedings. (2001) *presented 9/01*

Ansari, D.M.; D.A. Taylor, R.W. Bradshaw; P.D. Clemensen; **A. Calhoun.**⁺ “Choosing the Correct Calcium Carbonate for Opacification and Physical Properties” Intertech’s Functional Additives Proceedings. (2000) *Paper presented by Mr. Clemensen*

Calhoun, A.; Ansari, D.M.⁺ “The Partial Replacement of TiO₂ by Calcium Carbonate in HDPE Films” TAPPI 2000 Proceedings (2000). *Paper presented by Dr. Ansari*

Calhoun, A.⁺; R.W. Bradshaw; J.D. Prince. “The Use of Calcium Carbonate to Enhance the Physical Properties of Rigid Vinyl Products” VinylTec ’99 Proceedings. 32-37. (1999) *presented*

Calhoun, A.R.; A.D. King Jr.⁺; Y-H Lim. “NMR Chemical Shifts of ¹²⁹Xe Dissolved in Liquid Haloalkanes and Their Mixtures”. Presented at Southeast-Southwest Joint Regional Meeting of the ACS. Memphis, TN. November 29 – December 1, 1995.

* indicates student collaborators

+ indicates primary author

PATENTS

Calhoun, A.R.; Shurling, D.S. Miller, C.W.; Mobley, G.R.; McConnell, D.A. Patent # 6,582,775 “Particulate Carbonates and Their Preparation and Use in Breathable Films” Granted June 27, 2004. *United States Patent*.

Calhoun, A.R.; Shurling, D.S.; Skelhorn, D.A. Patent #6,569,527. “Particulate Carbonates and Their Preparation and Use in Thermoplastic Film Compositions” Granted May 27, 2003 *United States Patent*

Skelhorn, D.A.; **Calhoun, A.** Patent # 69323269 “Mineral Containing Thermoplastic Granules” Granted November 27, 2001 *United States Patent*

These inventions were also covered under several foreign patent applications though, for brevity, each patent is not listed.

FUNDING/ EQUIPMENT/TESTING GRANTS RECEIVED

12/4/2011 – “Scleractinian Samples of *Acropora formosa*, *Acropora acuminata* and *Goniastrea retiformis* for Neutron Activation and SEM/EDS analysis of Marshall Island corals collected before, during and after nuclear testing.” – Sample grant/donation from Smithsonian Institute Invertebrate Division. 27 Scleractinian samples, 2 extracoralline calcification samples.

9/2011 – “Scleractinian Genera and Species Across the World: Trace Metal Analysis via AAS and SEM/EDS” - Sample grant/donation from Smithsonian Institute Invertebrate Division. 124 Scleractinian samples

3/2011 – “Analysis of Scleractinian Corals for Trace Metal Composition via AAS and SEM/EDS for Evidence of Genera/Species based Vital Effects to Enhance Fitness” Independent Research Grant **\$40,000**,

2/2011 – “Analysis of Trace Metals in Calcium Carbonate in Tropical Corals as Markers in Bleached and Unbleached Species for Critical Environmental Ocean Assessment: Method Development” Whitman College Perry Research Grant **\$8000.00**

2/2011 – “Analysis of Micellar Cores Disrupted by Hydrotropes via Xe-129 NMR as a Means of Characterizing Potential in-vivo Drug Delivery Systems” HHMI Undergraduate Research Grant - **\$4,000**

6/2010 – “Innovations in Teaching and Learning in the Physical Chemistry Courses” -Whitman Curriculum Development Grant - **\$8400**.

2/2010 – “Analysis of Micellar Cores Disrupted by Hydrotropes via Xe-129 NMR as a Means of Characterizing Potential in-vivo Drug Delivery Systems” HHMI Undergraduate Research Grant **\$12,000**

1/2010 – “Acquisition of a 400 MHz NMR Spectrometer for Undergraduate Research and Research Training” NSF MRI Grant **\$420,000**, NMR (Co-PI)

3/2007 – “Acquisition of an X-ray Diffraction Instrument for Interdisciplinary and Collaborative Research and Education in an Undergraduate Setting” NSF MRI Grant **\$465,000**, XRD (Contributing scientist)

6/2005 – “Analysis of Eastern Washington Soils Via NAA for Selenium for Comparison to Mule Deer Population Studies.” Whitman College Perry Research Grant. **\$8000**

1/2005 – “¹²⁹Xe NMR Spectrometry of Rubredoxin” Whitman College Abshire Grant - **\$2000**

6/2004 – Washington State Nuclear Research Center **\$5000** Stipend award

6/2004 – Fluke Equipment Grant - **\$4000** of equipment

3/2004 – NMR donation by Lexmark Industries – Equivalent Worth **\$40,000**

6/2003 – “Polymer Oxidation Studied via Inverse Gas Chromatography” Whitman College Perry Grant **\$8000**

6/2003 – “Surface Chemistry of Silanes and Phenyl-Derivative Carboxylic Acids on the Surface Chemistry of Calcium Carbonate via Inverse Gas Chromatography.” Applied Extrusion Technologies - Student Summer Stipend - **\$3000**

PROFESSIONAL RESEARCH RELATED CERTIFICATIONS

PADI certification:

Basic Diver (6/2011)

Advanced Diver (9/2011)

Rescue Diver (9/2011)

Scientific Diver Training

University of Washington Friday Harbor Laboratories (9/2011)

Washington Boat Operator Certificate (6/2011)

CPR – First Aid (9/2011)

Oxygen Administration/SCUBA CPR certification (9/2011)

PROFESSIONAL AFFILIATION ACTIVITIES

Physical Chemistry 2010 Standardized Test Development Team – American Chemical Society -

2007-current

Quantum and Thermodynamics test completed and beta test forms available for trial testing. Kinetics form currently in development.

Peer Reviewer for Journal of Colloid and Interface Science

2006- current

Peer Reviewer for Polymer Science and Engineering Technology

2006 - current

Flexible Packaging Division Secretary –

2006-2008

Technical Program Chair for ANTEC '08 Division 44

Responsible for coordinating and reviewing abstracts and papers for the Flexible Packaging Division's activities and sessions at SPE's annual technical conference - May 2008.

House Chair for Flexible Packaging Conference December 2006

Responsible for planning and coordinating the activities at the conference venue including coordinating meals, receptions, exhibition hall design and meeting hall spaces.

Technical Program Chair for ANTEC '06 Division 44

Responsible for coordinating and reviewing abstracts and papers for the Flexible Packaging Division's activities and sessions at SPE's annual technical conference - May 2006.

Technical Program Chair for the Flexible Packaging Conference 2005

Responsible for developing , planning and implementing the technical program for the conference including recruiting speakers for podium and panel presentations, acting as a peer reviewer and organizing the sessions by topic. March 2005

House Chair for Flexible Packaging Conference 2004

Responsible for planning and coordinating the activities at the conference venue including coordinating meals, receptions, exhibition hall design and meeting hall spaces.

Conference Article Reviewer – ANTEC 2003-current

Plastic Technician's Toolbox©

Society of Plastics Engineers

Member of Steering Committee for the development of the *Extrusion Toolbox*

August 2002 –May 2004

Society of Plastics Engineers

Member of Steering Committee for the development of the *Injection Molding Toolbox*

Sept 1999 – May 2002

HONORS

Whitman College

George Ball Outstanding Advisor Award – 2008

Society of Plastics Engineers

Outstanding Service Award – May 2002

Certified Plastics Technician – June 1997

University of Georgia

Outstanding Graduate Teaching Assistant (1996)

Chemistry Department Outstanding Teaching Assistant Award (1994, 1996)

Office of Instructional Development; Award for recognition of Excellence in Teaching (1994)